Complete Summary

GUIDELINE TITLE

In-hospital transport of the mechanically ventilated patient: 2002 revision and update.

BIBLIOGRAPHIC SOURCE(S)

Chang DW. AARC Clinical Practice Guideline: in-hospital transport of the mechanically ventilated patient--2002 revision & update. Respir Care 2002 Jun;47(6):721-3. [27 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

This updates a previously released version (Respir Care 1993 Dec;38[12]:1169-72).

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Conditions requiring mechanical ventilation

GUIDELINE CATEGORY

Evaluation
Management

CLINICAL SPECIALTY

Anesthesiology
Critical Care
Emergency Medicine
Internal Medicine
Pulmonary Medicine

INTENDED USERS

Respiratory Care Practitioners

GUIDELINE OBJECTIVE(S)

To provide clinical practice guidelines on in-hospital transportation of a mechanically ventilated patient for diagnostic or therapeutic procedures

TARGET POPULATION

Mechanically ventilated patients requiring in-hospital transportation for diagnostic or therapeutic procedures

INTERVENTIONS AND PRACTICES CONSIDERED

In-hospital transportation of mechanically ventilated patients for diagnostic or therapeutic procedures, assuring constant monitoring, ventilation, oxygenation, and patient care during movement

MAJOR OUTCOMES CONSIDERED

The safe arrival of the mechanically ventilated patient

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Description/Definition:

Transportation of mechanically ventilated patients for diagnostic or therapeutic procedures is always associated with a degree of risk. Every attempt should be made to assure that monitoring, ventilation, oxygenation, and patient care remain constant during movement. Patient transport includes preparation, movement to and from, and time spent at destination.

Settings:

The guideline is intended for the critical care and acute care inpatient setting.

Indications:

Transportation of mechanically ventilated patients should not be undertaken until a complete analysis of potential risks and benefits has been accomplished.

Contraindications:

Transportation of the mechanically ventilated patient should not be undertaken until a complete analysis of potential risks and benefits has been accomplished.

- Contraindications include:
    1. Inability to provide adequate oxygenation and ventilation during transport either by manual ventilation, portable ventilator, or standard intensive care unit ventilator
    2. Inability to maintain acceptable hemodynamic performance during transport
    3. Inability to adequately monitor patient cardiopulmonary status during transport
    4. Inability to maintain airway control during transport
    5. Transport should not be undertaken unless all the necessary members of the transport team are present

Limitations of Method:

The literature suggests that nearly two thirds of all transports for diagnostic studies fail to yield results that affect patient care.

Assessment of Need:

The necessity and safety for transport should be assessed by the multidisciplinary team of health care providers (e.g., respiratory therapist, physician, nurse). The risks of transport should be weighed against the potential benefits from the diagnostic or therapeutic procedure to be performed.

Resources:

- Equipment
    1. Emergency airway management supplies should be available and checked for operation before transport.
    2. Portable oxygen source of adequate volume.
    3. A self-inflating bag and mask of appropriate size.
    4. Transport ventilators have been shown to provide more constant ventilation than manual ventilation in some instances. If a transport ventilator is used, it should:
        a. Have sufficient portable power supply for the duration of transport
        b. Have independent control of tidal volume and respiratory frequency
        c. Be able to provide full ventilatory support as in assist-control or intermittent mechanical ventilation (not necessarily both)

    d. Deliver a constant volume in the face of changing pulmonary impedance
    e. Monitor airway pressure
    f. Provide a disconnect alarm
    g. Be capable of providing positive end-expiratory pressure (PEEP)
    h. Provide an F_{IO2} of 1.0
5. A pulse oximeter may be desirable.
6. Appropriate pharmacologic agents should be readily available.
7. Portable monitor should display electrocardiogram (ECG) and heart rate and provide at least one channel for vascular pressure measurement.
8. An appropriate hygroscopic condenser humidifier should be used to provide humidification during transport.
9. Stethoscope.
10. Hand-held spirometer for tidal volume measurement.

- Personnel:

  All mechanically ventilated patients should be accompanied by a registered nurse and a respiratory therapist during the entire transport.

  1. At least one team member must be proficient in managing the airway in the event of accidental extubation.
  2. At least one team member should be proficient in operating and troubleshooting all of the equipment described above.

Monitoring:

Monitoring provided during transport should be similar to that during stationary care.

- Electrocardiograph should be continuously monitored for heart rate and dysrhythmias.
- Blood pressure should be monitored continuously if invasive lines are present. In the absence of invasive monitoring, blood pressure should be measured intermittently via sphygmomanometer.
- Respiratory rate should be monitored intermittently.
- Airway pressures should be monitored if a transport ventilator is used.
- Tidal volume should be monitored intermittently to assure appropriate ventilation.
- Continuous pulse oximetry is appropriate during transport of all mechanically ventilated patients.
- Breath sounds should be monitored intermittently.

Frequency:

Patients should be transported only when indications are present.

Infection Control:

- Universal Precautions should be observed.
- All equipment should be disinfected between patients.

- U.S. Centers for Disease Control and Prevention recommendations for control of exposure to tuberculosis and droplet nuclei are to be implemented when patient is known or suspected to be immunosuppressed, is known to have tuberculosis, or has other risk factors for the disease.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Safe in-hospital transportation of mechanically ventilated patients

POTENTIAL HARMS

Hazards and complications of transport include the following:

- Hyperventilation during manual ventilation may cause respiratory alkalosis, cardiac dysrhythmias, and hypotension.
- Loss of positive end-expiratory pressure (PEEP)/continuous positive airway pressure (CPAP) may result in hypoxemia or shock.
- Position changes may result in hypotension, hypercarbia, and hypoxemia.
- Tachycardia and other dysrhythmias have been associated with transport.
- Equipment failure can result in inaccurate data or loss of monitoring capabilities.
- Inadvertent disconnection of intravenous access to pharmacologic agents may result in hemodynamic instability.
- Movement may cause disconnection from ventilatory support and respiratory compromise.
- Movement may result in accidental extubation.
- Movement may result in accidental removal of vascular access.
- Loss of oxygen supply may lead to hypoxemia.
- Ventilator-associated pneumonia has been associated with transport.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

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Chang DW. AARC Clinical Practice Guideline: in-hospital transport of the mechanically ventilated patient--2002 revision & update. Respir Care 2002 Jun;47(6):721-3. [27 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1993 Dec (revised 2002 Jun)

GUIDELINE DEVELOPER(S)

American Association for Respiratory Care - Professional Association

SOURCE(S) OF FUNDING

American Association for Respiratory Care (AARC)

GUIDELINE COMMITTEE

2002 Clinical Practice Guideline Steering Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Revised by David W Chang, EdD, RRT

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This updates a previously released version (Respir Care 1993 Dec;38[12]:1169-72).

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Association for Respiratory Care (AARC) Web site.

Print copies: Available from American Association for Respiratory Care, 11030 Ables Lane, Dallas, TX 75229.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- The AARC Clinical Practice Guidelines. Respir Care 1996;41(7):647-53.

Print copies: Available from the American Association for Respiratory Care (AARC), CPG Desk, 11030 Ables Ln, Dallas, TX 75229-4593; Web site: www.aarc.org.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on November 30, 1998. The information was verified by the guideline developer on December 15, 1998. This summary was updated by ECRI on May 29, 2002. The updated information was verified on July 23, 2002.

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